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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,458	09/29/2003	Ryosuke Usui	57810-079	6655

7590 02/04/2005

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EXAMINER

PHAM, LONG

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

CA

Office Action Summary	Application No. 10/671,458	Applicant(s) USUI ET AL.	
	Examiner Long Pham	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
 4a) Of the above claim(s) 14-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 9-13 is/are rejected.
- 7) ☒ Claim(s) 2 and 4-8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/29/03</u> . | 6) <input checked="" type="checkbox"/> Other: <u>Labeled drawings</u> . |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-13 in the reply filed on 12/22/04 is acknowledged.

General Information

The labeled drawing sheet(s) of the present invention are attached to show examiner's understanding of the disclosed and claimed inventions.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 9, 10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rikio (Japan publication 05-048098) in combination with Brigham et al. (US 6,703,672).

With respect to claim 1, 12, and 13, Rikio teaches a semiconductor device comprising (see English abstract and figs. 1-4):

a first layer or gate 2a formed on a semiconductor substrate through a gate insulator 1b with an upper portion and a lower portion larger in width than a central portion for serving as a gate electrode.

Rikio fails to teach that the layer for forming the gate is made of silicon.

However, the use of silicon as gate material is well-known to one skilled in the art. For example, see the Background of the Invention.

Rikio further fails to teach silicide is formed over the gate.

However, the formation of silicide over the gate for reducing the resistance of gate is well-known to one skilled in the art. For example, see the Background of the Invention.

With respect to claim 3, Rikio fails to teach that the gate is made of bottom part of polysilicon and a top part of amorphous silicon.

Brigham et al. teach a gate includes a lower layer consisting of polysilicon and an upper layer consisting of an amorphous silicon to achieve smooth surface. See col. 7, lines 30-45.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the teaching of Brigham et al. into Rikio's device to obtain the above benefit. See col. 7, lines 30-45.

With respect to claims 9, 10, 12, and 13, Rikio in combination with Brigham et al. fail to teach repeating formation of the taught device.

However, It would have been obvious to one of ordinary skill in the art of making semiconductor devices to repeat the formation of the device taught by Rikio and Brigham et al. to obtain a plurality of devices all having advantageously smooth surface. See col. 7, lines 30-45.

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rikio (Japan publication 05-048098).

With respect to claim 11, Rikio teaches a semiconductor device comprising (see English abstract and figs. 1-4):

a semiconductor substrate 1; and

a gate electrode, comprising of two conductive layers, each formed on said substrate through a gate insulator 1b with an upper portion and a lower portion larger in width than a central portion.

Rikio teaches that the gate electrode is made of two conductive layers but fails to teach the gate electrode is made of only one conductive layer.

However, It would have been obvious to one of ordinary skill in the art of making semiconductor devices to omit one of the conductive layers to remove its function because "Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired". Ex parte Wu , 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989).

Rikio further fails to teach the gate is made of metal.

However, the use of metal as gate material is well-known to one of ordinary skill in the art of making semiconductor devices.

Allowable Subject Matter

4. Claims 2, 4, 5, 6, 7, and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, consisting of several fluid, overlapping loops and strokes, positioned above the printed name.

Long Pham

Primary Examiner

Art Unit 2814

LP